

Group 1 Furnaces

These are furnaces of any design that melt, hold or process aluminum that contains paint, lubricants, coatings, or other foreign materials with or without reactive fluxing, or process clean charge with reactive fluxing.

Emission Limits & Operation Standards

An owner or operator of a Group 1 furnace, including when part of a *secondary aluminum production unit* (SAPU), must have emissions of dioxin/furan toxic equivalents (D/F TEQ) no more than 2.1×10^{-4} grains per ton (gr/ton) [15 micrograms per megagram ($\mu\text{g}/\text{Mg}$)] of feed/charge.

When part of a SAPU, the Group 1 furnaces may also meet the emission limit based on the following equation, except for clean-charge-only units since they are not subject to a D/F limit:

$$L_{t_{D/F}} = \frac{\sum (L_{i_{D/F}} \times T_i)}{\sum (T_i)}$$

$L_{t_{D/F}}$ = the overall D/F limit for the SAPU (gr TEQ/ton of feed);

$L_{i_{D/F}}$ = the D/F emission limit for individual emission unit i (gr TEQ/ton of feed) in the SAPU;

T_i = the feed rate for individual emission unit i in the SAPU

The owner/operator must label each unit with the following information and inspect the labels once per month:

- ✓ type of unit
- ✓ emission limit
- ✓ control method used (lime injected fabric filter; work practice standards)
- ✓ operating parameters (such as: charge used; afterburner parameters; fabric filter inlet temperature; reactive flux injection rate; lime injection rate; sidewall or sidewall and hearth controlled).

A device to measure and record the weight of each charge or production batch must be

installed for each furnace. A device that measures and records the weight of reactive flux injected must also be installed. Each measurement and recording device must be operated, maintained and calibrated according to the Operation Maintenance & Monitoring (OM&M) plan. Refer back to the main Secondary Aluminum MACT standard fact sheet for details on the OM&M plan.

When fabric filters are used to meet emission limits they must also meet the following conditions:

- ✓ Maintain the inlet gas temperature as established in performance test $+25^{\circ}\text{F}$.
- ✓ Operate the unit according to OM&M plan.
- ✓ Initiate corrective action when process or operating parameters deviate from those established in OM&M plan.
- ✓ For continuous lime injection, maintain free flowing lime in hopper at all times and maintain feeder setting at same level established during performance test.

If no add-on control device is used, the unit must be operated within the range of charge materials, scrap contaminant levels, and operating parameter levels established in the site-specific monitoring plan. A melting/holding furnace may use only clean charge.

When using reactive fluxing, the rate of flux added (in pounds per hour) must be maintained at or below that established during the performance test for each furnace cycle. In the case of a **sidewall** furnace, reactive flux (except for cover flux) can only be added to the sidewall unless emissions from **both** the sidewall and hearth are combined to demonstrate compliance with the emissions limit.

Compliance Demonstration

Each control device/method used will have its own requirements for demonstrating compliance. Refer back to the main Secondary Aluminum MACT standard fact sheet for details on general compliance demonstration require-

ments for: capture and collection systems, feed/charge rate measurement devices, the OM&M and SSM (Startup, shutdown and malfunction) plans, notifications/reports and records. Only those requirements unique to the Group 1 Furnace or SAPU will be included here.

Lime-injected Fabric Filters

When a fabric filter is used to meet the emission limit, the owner/operator must install, calibrate, maintain and operate a bag leak detection system or continuous opacity monitoring system (COMS). If the leak detection system is other than a COMS, the system must be equipped with an alarm to indicate when a leak occurs. They must initiate corrective action within 1 hour of an alarm. The fabric filter must be operated such that the alarm sounds less than 5% of the operating time. The unit must be inspected annually and records kept of each inspection and any corrective action taken. Also, records of total operating time and time of alarms must be kept.

The inlet temperature to the fabric filter should be measured continuously and recorded every 15 minutes. Determine and record 15-minute block averages and 3-hour block average temperatures. Also record excursions from the appropriate operating values for inlet temperature, the cause and any corrective action taken.

Maintain free flowing lime in the hopper or silo at all times. Inspect the hopper or silo once every 8 hours to verify. The feeder setting/injection rate must be operated within range established during the performance test. Record the feeder setting once per day.

Without Add-on Controls

When operating a sidewall furnace, a log of the amount of flux added must be maintained and certified every 6 months that flux was only added to the sidewall. To measure the reactive flux addition rate, a device with accuracy of $\pm 1\%$ must be installed, operated, maintained and calibrated. Record the weight and type of reactive flux injected for each 15-minute block period while reactive fluxing occurs. Calculate and record total reactive fluxing for each operating cycle or time period used in the performance test.

Monitor and record any other parameters used to demonstrate compliance during the performance test to show correlation of emission across the range of charge and flux materials and furnace operating parameters.

For melting/holding furnaces, record the type of permissible feed/charge material and certify to the use of those materials every 6 months.

When no add-on control is used, the owner/operator must develop a **Scrap Inspection Program** or **Scrap Contamination Monitoring Program**. The following elements must be included in those programs:

SCRAP INSPECTION

- ✓ Proven method to collect representative samples.
- ✓ Method to measure oil and coatings content.
- ✓ Scrap inspector training program.
- ✓ Correlation between visual inspection and physical measure of oil and coatings content.
- ✓ Comparison of randomly selected scrap with visual inspection results for oil and coatings.
- ✓ System to assure only acceptable scrap is charged to furnace.
- ✓ Record keeping requirements to document conformance with plan.

SCRAP CONTAMINATION MONITORING

- ✓ Calculation method.
- ✓ Procedures for characterization of distinct scrap types.
- ✓ Documentation of contaminant level of scrap prior to performance test.
- ✓ Limitations on the furnace feed/charge including the proportion of scrap of each distinct type used during the performance test.
- ✓ Method to ensure that no scrap with a contaminant level higher than that used in performance test is charged to the furnace.
- ✓ Certification of scrap contaminant level.

Each of the different work practices or pollution prevention measures taken by a Group 1 furnace without add-on controls must be spelled out in a Site Specific Monitoring Plan, which is a required element under the overall OM&M plan. Refer back to the main Secondary Aluminum MACT fact sheet for the elements of an OM&M plan.

Unit In a SAPU

A SAPU may be defined by whether it is existing or new. An existing SAPU is all existing Group 1 furnaces and all existing in-line fluxers at the facility. A new SAPU is any combination of individual Group 1 furnaces and in-line fluxers at the facility that were either constructed prior to February 11, 1999 or have been permanently redesignated (at the owner/operators request) as a new emissions unit. Refer to the

rule for details on how to permanently redesignate a unit as new under a SAPU.

Use the following equation to calculate the aluminum mass-weighted D/F limit for the SAPU. Compliance is achieved if the emissions calculated are less than or equal to the SAPU limit $L_{tD/F}$ provided previously in this fact sheet.

$$E_{CD/F} = \frac{\sum (E_{tiD/F} \times T_{ti})}{\sum (T_{ti})}$$

$E_{CD/F}$ = the mass-weighted D/F emissions for the SAPU;

$E_{tiD/F}$ = measured D/F emissions for individual emission unit i in the SAPU;

T_{ti} = the feed rate for individual emission unit i in the SAPU

Alternatively, they may demonstrate compliance for a SAPU by demonstrating that each individual unit is in compliance with the limit of 2.1×10^{-4} gr/ton of feed.

Performance Testing

An initial performance test is required **by March 23, 2003** to demonstrate that each emissions unit or control device can meet the level of emissions required in the limit. A repeat performance test will be required every five years following the initial test. You must submit a test plan 60 days prior to the date the test is scheduled. The plan should outline the test methods and procedures to be followed.

Each performance test for demonstrating compliance with D/F emissions limits shall include USEPA Methods 1-4 and 23. The following methods shall also be used during each performance test:

- ✓ each test must be performed at the outlet of the emissions unit or control device - when testing commonly ducted units it must be arranged so that compliance is demonstrated for each unit;

- ✓ each test must be performed at the highest capacity of the process with charge materials representative of the range of materials processed;
- ✓ for a continuous process the test must consist of 3 runs, each of the length specified in the test method or, if not specified, a minimum of 3 hours;
- ✓ for a batch process the test must consist of 3 runs, each conducted over the entire process operating cycle;
- ✓ for multiple units exhausted through a common stack, each run must be conducted over a period of time during which each of the units completes at least one entire operating cycle or for 24 hours, whichever is shorter;
- ✓ when testing a particular Group 1 furnace as a representative unit for all other Group 1 furnaces, certain criteria must be met - refer to the rule for details;
- ✓ for each afterburner, the temperature must be continuously monitored at the exit of the combustion chamber and recorded every 5 minutes during the test, and must be maintained at or above 1400°F in each 3-hour block;
- ✓ for each fabric filter, the temperature must be continuously monitored at the inlet to the device and recorded every 15 minutes during the test;
- ✓ for lime-injected fabric filters, the feeder setting for each silo must be recorded for each test run;
- ✓ the weight of reactive flux injected must be measured and recorded for each 15 minute period during the test, from which 15 minute block and 3 hour block averages shall be determined and a total weight injected for all three test runs, the type and composition of flux added for each run must also be recorded;
- ✓ establish minimum/maximum operating parameter values during the performance test.

Notifications & Reports

Refer back to the main Secondary Aluminum MACT standard fact sheet for details on the notifications and reports due under this rule.



Contacts for More Information or Assistance.

The Small Business Clean Air Assistance Program helps smaller businesses understand and comply with the Clean Air Act regulations. Contact one of the program's Clean Air Specialists for more assistance: Renée Lesjak Bashel at 608/264-6153 or Tom Coogan at 608/267-9214.



For further information on the Secondary Aluminum MACT contact your DNR Regional or Service Center office shown on the **DNR Contact Fact Sheet** available from SBCAAP.